

Hydrophobic Polymers with Adherend Complexing Sidechains as Durable Aerospace Adhesives, Phase II

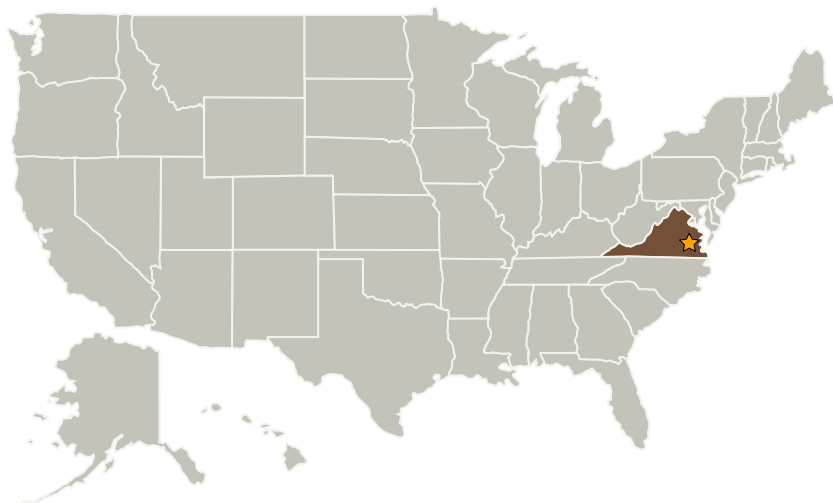
Completed Technology Project (2009 - 2011)



Project Introduction

In support of NASA Aeronautics Research Mission Directorate and Aviation Safety Mission, NanoSonic has developed a series of moisture and corrosion mitigating, ultra-hydrophobic, environmentally tunable, nanophase separating adhesive modifiers and complementary high performance, wide service temperature range (-60°C to 450°C) structural adhesives. The smart nanostructured modifiers represent a significant discovery as the adhesion strength of our novel and commercial-off-the-shelf aerospace adhesives was increased by > 40% with inclusion of such systems upon aging in 100% relative humidity (RH), ten days, 140°F. Of significant importance to manufacturability and dual-use commercialization, the novel modifying agents are inert, inorganic-organic, halogenated hybrid copolymers, and hence can be used with virtually any adhesive, paint or environmental aerospace materials systems. The inorganic poly(octahedral silsesquioxane) (POSS), fluorination and copolymer molecular weight can be synthetically engineered to complement any paste of film adhesive. The TRL of the novel adhesive system would be increased from 6-8 during Phase II.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Nanosonic, Inc.	Supporting Organization	Industry	Pembroke, Virginia

Primary U.S. Work Locations

Virginia

Project Transitions

**December 2009:** Project Start**December 2011:** Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.1 Lightweight Structural Materials